

## REMARKS/ARGUMENTS

The present comments are intended to demonstrate that the subject matter of the aforesaid patent application is novel over and patentable over the references cited in the International Search Report of the PCT application of which this is a national-phase counterpart.

### DOCUMENTS CITED BY I.S.A.

The following documents were cited in the International Search Report:

- US patent 4,188,673 Rotatable pop-up delivery head for pool cleaning systems (Carter), dated Feb. 19, 1980, hereinafter sometimes referenced as “the ‘673 patent”;
- US patent 4,939,797 Water delivery assembly for cleaning swimming pools (Goettl), dated Jul 10, 1990, sometimes hereinafter referred to as “the ‘797 patent.”

Each of these documents was classified by the Examiner for the International Searching Authority (“I.S.A.”) as belonging to Category “X”, meaning that the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone.

The main features and characteristics of each of the above-referenced documents will be briefly reviewed.

#### **Carter Patent 4,188,673**

The ‘673 patent discloses a rotatable head assembly generating a water jet substantially parallel to the bottom of a swimming pool. The assembly has its exposed end positioned flush with the interior surface of the pool and comprises a first fixed housing 26 coupled to the water delivery pipe 17. Coupled by a threaded joint to said first housing, a second fixed housing 30 holds a piston structure 37-38 which has an exit port 46 offset a distance D from the vertical axis of said piston. The exit port communicates with the interior of both housings 26 and 30.

When water under pressure is delivered by pipe 17, it drives outwardly the piston, so that the exit port rises above of the bottom surface and a water jet issues from the port 46. An internal flange 41 in the second housing engages an external flange 40 provided in the piston structure, limiting its outward movement. The flange 41 also acts as a support for the piston when it falls back into its rest position as the water delivery is interrupted. Due to the eccentricity of the jet stream expelled through port 46, a rotating force is applied to the piston structure, causing it to turn around its vertical axis during its upward

movement from the resting position to the operating position and also during its downward movement, so that each time the head is operated, the water jet is issued in a different direction.

As shown in Fig. 2, the assembly is embedded in the concrete wall of the swimming pool's bottom, the outer housing 26 being provided with an outer flange 27 which serves as an anchoring means of the housing to the concrete.

### **Goettl Patent 4,939,797**

The operation of the pop-up jet delivery heads of the '797 patent is based on the same general principle as the heads in the previously discussed '673 patent, to wit: (a) the water pressure pushes upwardly a piston structure; (b) the force generated by the reaction of an eccentric jet force provides the rotation of the piston during its excursion from the resting position to its operating position.

The assembly comprises an outer shell 21 whose lower end is inserted into the inlet pipe 23, its upper end 22 being flush with the inner surface of the swimming pool floor. The outer shell is also provided with an outer flange, not referenced in the drawing and not referred to in the Specification. However, due to the fact that no other means or structure intended to anchor the device to the bottom of the pool is shown or described in this document, it is evident that the shell is embedded in the concrete wall of the pool's bottom, in a manner similar to the assembly described in the '673 patent.

The difference between the '673 patent and the '797 patent is that in the latter, a sequencer is used to activate the nozzles, so that not more than one or two pop-up heads are operated at a given time. However, no details are given regarding the opening and closing of the valves to avoid any water hammer effects.

### **MAIN FEATURES DISCLOSED IN PCT/BR2004/000042**

The present patent application, heretofore referred to as PCT/BR application, describes a pool cleaning device attached to the bottom of a swimming pool or similar water-containing vessel (such as a reservoir), comprising a piston (21) which is impelled upwards by the water pressure applied through a pipe (13), so that a hole (29) located near its top surface (25) stands out of the pool's bottom, allowing a water jet to be projected substantially parallel to the bottom surface. A plurality of such devices are distributed in the pool's bottom surface, each device being actuated one at a time by means of solenoid valves controlled in a known manner, as stated in lines 18-23, page 6 of the Specification.

As shown in Fig. 4-b of the PCT/BR application, the outlet hole is positioned eccentrically to the center of the piston, providing a force which tends to rotate the piston during its downward return to its resting position. As stated in lines 1-10 in page 6 of the Specification, the jet does not stop abruptly, but the water flow diminishes gradually due to the fact that, before a given valve is closed, the next valve is opened, so that the water pressure is diverted to the newly actuated head. The residual jet issuing from the previously actuated head is sufficiently strong to impart an arcuate movement to the piston 21, so that, at the end of its descent, its outlet hole will be positioned at an angle relative to its former position.

The details concerning the attachment of the device to the bottom of the pool are shown in Fig. 3 as well as stated in lines 28, page 4 to line 03, page 5 of the Specification. According to the drawing and the text, the fiberglass shell which forms the pool's bottom is clamped between a first flange 14, which presses the underside surface 15 of the shell, and second flange 17, which presses the upper surface 16 of the shell, the compression force between the flanges being provided by stainless screws (mentioned on line 03, page 5), the upper edge of the "T" coupling 11 being attached to the first flange.

The method shown in Fig. 3 is particularly suitable for attaching the jet delivery device to structures having walls and/or bottom comprising comparatively thin and strong partitions, such as pools or reservoirs built of fiberglass, thermoplastics, metal sheets or tiles.

## **NOVELTY OF THE PRESENT PCT/BR APPLICATION**

As stated before and shown by the drawings accompanying the patent documents cited in the international search, the jet-producing devices described in the '673 and '797 patents are intended to be embedded in the concrete floor of swimming pools, their retention in the concrete mass being insured by the flanges that surround the corresponding outer shells. Although the present invention, as disclosed in application PCT/BR, could be embedded in a concrete floor, it is not provided with such flange retention means. The present invention is particularly adapted for attachment to thin partitions, this being achieved by the clamping effect of a cooperating set of flanges juxtaposed to the upper surface 16 and lower surface 15 of the partition.

The devices described in the '673 and '797 patents possess no means whatsoever for allowing such attachment, being intended, as stated before, for embedding in a wall made of concrete or similar material. Therefore, they do not anticipate the subject matter of the

present invention as disclosed in the PCT/BR application and claimed as recited herein.

Moreover, the cited references make no mention of any means for decreasing the water hammer effect, alternatively known as ram stroke, which unavoidably occurs with the sudden closure of valve 31 (in the '673 patent) or the sequencing valves mentioned in the Specification (line 9, column 9). Neither of the cited patents anticipates or even suggests the opening of a valve before the closing of the previous one in order to avoid such destructive water hammer effect.

Respectfully submitted:

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